

Title (en)
METHOD FOR GENERATING AT LEAST ONE DETERMINISTIC F-CENTRE IN A DIAMOND LAYER, DIAMOND LAYER WITH AT LEAST ONE DETERMINISTIC F-CENTRE AND DOPANTS AND USE OF A DIAMOND LAYER WITH AT LEAST ONE DETERMINISTIC F-CENTRE

Title (de)
VERFAHREN ZUR ERZEUGUNG ZUMINDEST EINES DETERMINISTISCHEN FARBZENTRUMS IN EINER DIAMANTSCHICHT, DIAMANTSCHICHT MIT ZUMINDEST EINEM DETERMINISTISCHEN NV-ZENTRUM UND DOTANDEN SOWIE VERWENDUNG EINER DIAMANTSCHICHT MIT ZUMINDEST EINEM DETERMINISTISCHEN FARBZENTRUM

Title (fr)
PROCÉDÉ DE PRODUCTION D'AU MOINS UN CENTRE DE COULEUR DÉTERMINISTE DANS UNE COUCHE DE DIAMANT, COUCHE DE DIAMANT AVEC AU MOINS UN CENTRE DE COULEUR DÉTERMINISTE ET DES DOPANTS ET UTILISATION D'UNE COUCHE DE DIAMANT AVEC AU MOINS UN CENTRE DE COULEUR DÉTERMINISTE

Publication
EP 3990684 B1 20231101 (DE)

Application
EP 20735338 A 20200626

Priority
• DE 102019117423 A 20190627
• EP 2020068110 W 20200626

Abstract (en)
[origin: WO2020260640A1] The invention relates to a method for generating at least one deterministic F-centre in a diamond layer. By implanting at least one dopant in the diamond layer in a first step and incorporating at least one foreign atom in the diamond layer by means of low-energy ion bombardment for the formation of the F-centre in a second step, very high conversion rates of greater than 70% can be achieved. This is a significant increase in relation to undoped diamond, in which the conversion rates are only around 6%. Via doping with a donor, such as phosphorous, oxygen or sulphur, a very good conversion into negatively charged F-centres can be achieved, which are used for Qubit applications.

IPC 8 full level
C30B 29/04 (2006.01); **B82Y 10/00** (2011.01); **C30B 31/22** (2006.01); **C30B 33/02** (2006.01)

CPC (source: CN EP US)
C01B 32/28 (2017.08 - US); **C30B 29/04** (2013.01 - CN EP US); **C30B 31/22** (2013.01 - CN EP US); **C30B 33/02** (2013.01 - CN EP US); **B82Y 10/00** (2013.01 - EP US); **B82Y 40/00** (2013.01 - US); **C01P 2002/52** (2013.01 - US)

Citation (examination)
MELTON CHARLES E. ET AL: "Experimental evidence that oxygen is the principal impurity in natural diamonds", NATURE, vol. 263, no. 5575, 1 September 1976 (1976-09-01), London, pages 309 - 310, XP055802494, ISSN: 0028-0836, Retrieved from the Internet <URL:http://www.nature.com/articles/263309a0.pdf> DOI: 10.1038/263309a0

Designated contracting state (EPC)
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

DOCDB simple family (publication)
DE 102019117423 A1 20201231; CN 114127344 A 20220301; CN 114127344 B 20240625; EP 3990684 A1 20220504; EP 3990684 B1 20231101; EP 3990684 C0 20231101; EP 4276060 A2 20231115; EP 4276060 A3 20231213; US 2022364268 A1 20221117; WO 2020260640 A1 20201230

DOCDB simple family (application)
DE 102019117423 A 20190627; CN 202080046787 A 20200626; EP 2020068110 W 20200626; EP 20735338 A 20200626; EP 23188146 A 20200626; US 202017619302 A 20200626